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structs this bridge across the South Pacific from Chile to Samoa and thence to New Zealand, that of Forbes, which assumes an immense Antarctic continent, and that of Pilsbury and v. Ihering, which accounts for the similar forms in South America, Tasmania, and Australia by the hypothesis of a former more extensive Austral continent which subsequently became united with South America at Cape Horn, Hedley gives his own solution of the problem. He says that "during the Mesozoic or older Tertiary, a strip of land with a mild climate extended across the South Pole from Tasmania to Terra del Fuego, and that Tertiary New Zealand then reached sufficiently near to this Antarctic land, without joining it, to receive by flight or drift many plants and animals." This "Antarctica" was of an unstable character, "at one time dissolving into an archipelago, at another resolving itself into a continent." Thus a deep gulf extended from Tasmania to Cape Horn, stretching within a few degrees of the pole, and this assumption would tend to explain some facts of distribution of marine shallow-water animals.

It seems to us that this theory has some advantage over the other theories mentioned, yet it is perhaps premature to form a distinct idea as to the connection of the southern ends of the present continents. That such was present before or at the beginning of Tertiary times seems to be beyond doubt, but for the actual construction of this bridge the data at hand seem to be too imperfect. But this much we may safely assume, as Hedley does, that this bridge was no constant and solid mass all the time it existed, but was repeatedly broken up into parts, making possible an exchange of life in different directions.

The particular idea of Hedley on this subject, even if we do not at once accept it, is at least worth considering seriously, and the frequent and very complete references to previous writers form one of the features of his article that make it the more valuable for the student of this fascinating question of the "Antarctica." A. E. O.

ZOOLOGY.

Accessory Bladders of Turtles. — F. W. Pickel¹ has studied the accessory bladders of turtles, and finds these organs present in semi-

¹ Pickel, F. W. The Accessory Bladders of the Testudinata, *Zoölogical Bulletin*, vol. ii, No. 6, pp. 291-301. September, 1899.

terrestrial and semi-aquatic species. They are wanting, or greatly reduced, in the strictly aquatic and strictly terrestrial forms. The author believes that these bladders are receptacles for liquid stored up for the use of the animal, but he could not confirm the statement of earlier observers that the fluid was water taken in through the cloaca.

G. H. P.

Osteology of the Percosoces. — Professor Edwin Chapin Starks, now of the University of Washington, gives in the *Proceedings of the United States National Museum*, pp. 1-10, a valuable study of the osteology of the suborder of fishes known as Percosoces. He finds the members of this group less closely related than would be supposed from their resemblance in external characters, although really allied. The Sphyrænidæ (Barracudas) stand as a group opposed to the remaining families Mugilidæ (mulletts) and Atherinidæ (silversides: Pesce-Rey). The osteology of a typical member of each family is given, with illustrative plates by the skillful hand of Mrs. Starks, who, as Chloe Lesley, was formerly the artist of the Hopkins Laboratory at Stanford University.

In all these species the so-called coronoid bone is present, but Professor Starks doubts its homology with the coronoid bone of reptiles, and thinks that the systematists have made too much of it and the anatomists not enough. It has little systematic value, for it is present in many unrelated genera (catfish, sucker, striped bass, bluefish, cod), while, on the other hand, it has been generally overlooked by anatomists as a structure present in fishes.

Starks on the Relationships of Dinolestes. — In the *Proceedings of the United States National Museum*, Professor Edwin Chapin Starks undertakes to settle the vexed question of the affinities of the Australian fish, *Dinolestes lewini*, by a study of its osteology.

In spite of its resemblance to the Barracuda and the Pesce-Rey, he finds no evidence of close affinity and places *Dinolestes* among the true percoids. It is probably allied to Sphyrænops and Scombrops and belongs to the family of Cheilodipteridæ.

The Peripheral Nervous System of Bony Fishes. — The cranial and first spinal nerves of the common silverside, *Menidia*, have been investigated by C. J. Herrick.¹ Four components are now generally recognized in the spinal nerves of vertebrates: (1) somatic motor

¹ Herrick, C. J. The Peripheral Nervous System of the Bony Fishes, *Bull. U. S. Fish Comm.*, 1898. pp. 315-320. 1899.